

REMARKS1. Amendments to the Specification

To have a more definite and clearly defined invention, Applicants have amended the written specification. No new matter has been introduced by the amendments. Applicants have submitted a substitute specification incorporating the aforementioned amendments.

2. Rejections under 35 USC § 102(a)

Claims 85 and 94 were rejected pursuant to 35 USC Section 102(a) as allegedly being anticipated by admitted prior art. Upon reviewing the admitted prior art, Applicants believe that the references of Chou et al. entitled "Lithographically Induced Self-Assembly Of Periodic Polymer Micropillar Arrays" [hereinafter referred to as Chou] and Mansky et al. entitled "Large-Area Domain Alignment In Block Copolymer Thin Films Using Electric Fields" [hereinafter referred to as Mansky] are the most relevant. To summarize the standard, rejections under Section 102 are proper only when one prior art reference discloses every feature of the claimed invention so that there is no physical difference between the reference and the claimed invention (see In re Marshall, 198 USPQ 344 (CCPA 1978)).

Claims 85 and 94, as amended, define a method for creating a pattern on a body, including, *inter alia*, moving a portion of a liquid between a template and the body to form a contiguous region of the liquid between two spaced-apart electric field gradients, with each of the electric field gradients being defined by first and second electric fields,

with the first electric field being adjacent to the second electric field and the first electric field being greater than the second electric field.

Applicants advocate this method in order to allow patterning of the liquid in a timely manner (in a time less than about 1 second) and controlling the distribution of the liquid on the substrate. Specifically, Applicants' claimed invention involves applying an electric field between a template and a substrate, with the electric field varying with respect to the topography of the template. An electrostatic force created by the electric field attracts portions of the liquid towards the template with the liquid forming a contiguous region with respect to the template (see paragraph [0027] and Fig. 2).

Chou, on the other hand, does not teach of forming a contiguous region of the liquid between two spaced-apart electric field gradients, with each of the electric field gradients being defined by first and second electric fields, with the first electric field being adjacent to the second electric field and the first electric field being greater than the second electric field. Rather, Chou teaches towards forming a pillar array of a PMMA (polymethylmethacrylate) film underneath a template. This is seen throughout Chou. Pillar formation can be seen in the initial deposition of the liquid as is referred to on page 3197, second column, first paragraph, "initially flat polymer film self-assembles into periodic supramolecular pillar arrays." Also, when a template is placed above the surface of the PMMA film, "pillars are formed under the corners [of the mask]" (see page 3201, first column, second

paragraph), and "once the pillars reach the mask, the process will repeat, until all small amplitude capillary peaks under the mask protruding patterns develop into full pillars" (see page 3201, second column, first paragraph). Referring to Fig. 7, it can be more clearly shown that the liquid on the substrate forms a pillar array underneath a mask. It is then evident that this pillar array underneath a template that Chou teaches towards is not the contiguous region that Applicants teach towards. The pillar array is in fact a noncontiguous region. Thus, it becomes clear that Chou teaches away from Applicants' claimed invention in which a liquid on a body forms a contiguous region of liquid between two spaced-apart electric field gradients defined between first and second electric fields, with the first electric field substantially greater than the second electric field.

Mansky is completely silent with respect to forming a contiguous region of the liquid between two spaced-apart electric field gradients. Rather, Mansky is directed merely at orientating the liquid on a substrate. This is seen throughout Mansky. Mansky recognizes that a "serious limitation of...patterning techniques is the inability to control the positioning and orientation of the features [cylinders]" (see page 4399, first column, first paragraph). Therefore, Mansky utilizes an "in-plane electric field to uniformly orient the cylindrical microdomains of a P(S-*b*-MMA) diblock copolymer film" (see page 4399, first column, second paragraph). Orientation may comprise having "the cylinders...oriented parallel to the electric field direction" (see page 4400, second column,

first paragraph) to achieve "field-induced orientation" (see page 4400, second column, fourth paragraph). Thus, Mansky does not direct his invention to forming a contiguous region of the liquid between two spaced-apart electric field gradients.

The remaining references in the admitted prior art do not teach the claimed invention. Based on the foregoing, Applicants respectfully contend that the admitted prior art does not anticipate the invention defined by amended claim 85 and 94.

2. Rejections under 35 USC § 103(a)

a. Claims 85 and 94

Implicit in any rejection under section 102 is an inchoate rejection under Section 103(a). Therefore, Applicants address any inchoate obvious rejections, as well.

As mentioned above, claims 85 and 94, as amended, define a method for creating a pattern on a body, including, *inter alia*, moving a portion of a liquid between a template and the body to form a contiguous region of the liquid between two spaced-apart electric field gradients, with each of the electric field gradients being defined by first and second electric fields, with the first electric field being adjacent to the second electric field and the first electric field being greater than the second electric field. Applicants advocate this method in order to allow patterning of the liquid in a timely manner (in a time less than about 1 second) and controlling the distribution of the liquid on the substrate.

As mentioned above, Chou teaches away from Applicants' claimed invention by advocating forming a pillar array of a PMMA (polymethylmethacrylate) film underneath a template. Specifically, when a template is placed above the surface of the PMMA film, "pillars are formed under the corners [of the mask]" (see page 3201, first column, second paragraph), and "once the pillars reach the mask, the process will repeat, until all small amplitude capillary peaks under the mask protruding patterns develop into full pillars" (see page 3201, second column, first paragraph). Thus, Chou does not suggest Applicants' claimed invention.

Also, as mentioned above, Mansky is completely silent with respect to forming a contiguous region of the liquid between two spaced-apart electric field gradients because Mansky is directed merely at orientating the liquid on a substrate. As a result, Mansky does not recognize Applicants' problem.

Furthermore, none of the remaining admitted prior art overcomes the deficiencies of Chou and Mansky. Therefore, Applicants respectfully contend that a *prima facie* case of obviousness is not present with respect to claims 85 and 94.

b. Claim 102

In the Office action, it was alleged that claim 102 was rejected pursuant to 35 USC Section 103(a) as allegedly being obvious in view of Chou and Mansky. Claim 102, as amended, defines a method for creating a pattern on a body that includes other features distinguishable from the prior

art. Specifically, claim 102, as amended includes, *inter alia*, moving a portion of a polymerizable liquid toward a template to form a contiguous region of the polymerizable liquid between two spaced-apart electric field gradients, with each of the electric field gradients being defined by first and second electric fields, with the first electric field being adjacent to the second electric field and the first electric field being greater than the second electric field, and polymerizing said polymerizable liquid. Applicants contend that the argument set forth above with respect to claims 85 and 94 applies with equal weight here and that amended claim 102 defines an invention suitable for patent protection.

### 3. Dependent Claims

Considering that the dependent claims include all of the features of the independent claims from which they depend, these claims are patentable to the extent that the independent claims are patentable. Therefore, Applicants respectfully contend that the dependent claims define methods suitable for patent protection.

Applicants respectfully request examination of the amended claims. A notice of allowance is earnestly solicited.

CERTIFICATE OF MAILING

Respectfully Submitted, I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop NONFEE AMENDMENT, Alexandria, VA 22313.

Signed: *Alexis Sheffield*  
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Respectfully submitted



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